Name: Date:

Polynomial Factoring solution (version 3)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 16 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(16)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 64}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-48}}{2}$$

$$x = \frac{4 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{4 \pm 4\sqrt{3}\,i}{2}$$

$$x = 2 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 7i$ and $3 + 2i$ in standard form $(a + bi)$.**

Solution

$$(9 + 7i) \cdot (3 + 2i)$$

$$27 + 18i + 21i + 14i^2$$

$$27 + 18i + 21i - 14$$

$$27 - 14 + 18i + 21i$$

$$13 + 39i$$

Polynomial Factoring solution (version 3)

3. **Write function $f(x) = x^3 + 3x^2 - 6x - 8$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	3	-6	-8
-4		-4	4	8
	1	-1	-2	0

$$f(x) = (x+4)(x^2 - x - 2)$$

$$f(x) = (x+4)(x+1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+2) \cdot (x-2)^2 \cdot (x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.